Air Force SBIR **Impact**

Composite Materials With Better Performance

Company:
Assembly Guidance Systems, Inc.

Location:
Chelmsford, MA

Employees:
10

President:
Scott Blake

Project Officer:
Diana Carlin,
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Kirtland AFB, NM

Air Force Requirements:

Composite materials offer many performance benefits for both military and civilian products. These performance benefits include lighter weight with greater strength, fewer fasteners and better immunity to corrosion. Many products, which would show significant performance improvements if manufactured from composite materials, continue to be produced with lower performance materials because of high manufacturing costs related to material processing and quality control. For instance, a number of composite structures, because of their complexity, continue to be manufactured by the hand lay-up process. Additionally, some manual processing is still required in applications where the majority of the material processing is performed with fully automated equipment. To address these problems the Air Force SBIR office established a Composite Manufacturing Process Control System program. The goal of the program was to create a cost effective system which significantly lowered processing and quality monitoring costs for composite structures on USAF products.

The Air Force wanted a new system that would provide a complete link between the CAD model defining manual manufacturing processes and quality monitoring activities.

For more information on this story, contact Air Force TechConnect at 1-800-203-6451 or at www.afrl.af.mil/techconn/index.htm

SBIR Technology:

Assembly Guidance Systems, Inc.'s SBIR Phase I and II contracts resulted in LASERGUIDE PCS, a new technology to address the manufacturing and quality control problems. With the Composite Manufacturing Process Control System, templates of light are projected with laser light, accurately and full size, onto complex tooling to show assemblers where to locate each layer of material in a laminate. The same data defining the boundaries of the material being laid up is used to aim an inspection system to assure that the edges of the material are located within tolerance. The CAD data also aims a vision system to ensure that no Foreign Object Debris (FOD) is contaminating the laminate.

The SBIR Phase I and II contracts involved integrating a range of enabling technologies into a single product where each new technology enhanced quality improvement and cost savings. New technology allowed a significant reduction in projector size, which enables many applications that could not be performed by the earlier generation of laser pattern systems. New laser, optics and electro-mechanical technologies enabled multiple, independent and simultaneous projections, which doubled or tripled productivity over earlier systems of this type. Assuming a two year payback, savings of more than the entire cost of the SBIR contract has already been achieved by USAF suppliers using the LASERGUIDE PCS.

Company Impact:

Assembly Guidance has successfully commercialized the LASERGUIDE PCS as a result of experience gained in the SBIR Program. LASERGUIDEs have been adopted for production by Bell Helicopter - Textron, Lockheed Martin Skunk Works (not involved with Assembly Guidance in the SBIR program), Boeing, NASA, and Chrysler.

Company Quote:

"The SBIR Program provided the 'missing links' to enable our small, technology-based company to apply our specialized expertise to integrate, operate and refine new technologies in large company production environments. The result is the LASERGUIDE PCS, a new product, which, on the basis of its documented cost saving and quality improving capabilities, has been successfully adopted by large USAF contractors. The LASERGUIDE PCS is also being adopted in industries beyond large USAF contractors, helped along by the positive experience and endorsement of the USAF vendors."

Scott Blake
President
Assembly Guidance Systems, Inc.

SBIR

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